

Food-habits of water-birds of the Sundarban, 24 Parganas District, West Bengal, India—IV¹

Stork, Teal, Moorhen and Coot

BY

AJIT KUMAR MUKHERJEE

Superintending Zoologist, Zoological Survey of India, Calcutta

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Anastomus oscitans (Boddaert), The Openbilled Stork

The Openbilled Stork, *Anastomus oscitans* (Boddaert), is a marsh-loving bird found around tanks, lakes, rivers and estuarine mud-flats, and also foraging nearby in paddy fields.

About the food-habits of the Openbilled Stork, Jerdon (1864, p. 766) stated : 'It lives chiefly on molluscs, especially on the large *Ampullaria* but also on various others.' He further quotes Colonel Sykes' statement that it fed on species of *Unio*. He also found that in default of its proper food, this snail-eater will eat fish, frogs, etc., but shell-fish are its special favourite. Blanford (1898, p. 378) mentioned : 'They occasionally eat fish, crabs, etc., but subsist mainly on mollusca.' Baker (1929, p. 334) writes that it feeds principally on Mollusca, chiefly the Apple-snails, land-snails, crabs and small Mollusca which it crushes first and then swallows the entire contents including the shells. It also eats worms, frogs, lizards, small snakes, insects and fishes. Ali (1955, p. 102) recorded : '... soft body and viscera of . . . [*Ampullaria* snails] form a large proportion of its food in due seasons. It also eats frogs, crabs, large insects and other small living things.'

The detailed analysis of the stomach-contents of 72 adult specimens that the author collected in the Sundarban is given in Table 14.

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TABLE 14

ANALYSIS OF THE STOMACH-CONTENTS OF THE OPENBILLED STORK

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Phylum Chordata				
Class Reptilia				
Order Squamata				
Suborder Serpentes				
Family COLUBRIDAE				
<i>Ptyas mucosus</i> Linnaeus	9			Partly digested.
<i>Xenochrophis piscator</i> (Schneider)	5			
Total :	14	113	7.40	
Class Amphibia				
Order Anura				
Family RANIDAE				
<i>Rana tigerina</i> Daudin	3			Subadult.
Family BUFONIDAE				
<i>Bufo melanostictus</i> Schneider	8			-do-
Total :	11	39	2.55	
Series Pisces				
Class Teleostomi				
Order Ophiocephaliformes				
Family CHANNIDAE				
<i>Channa punctata</i> (Bloch)	4			Freshwater form. Length 30-40 mm
Order Perciformes				
Family ANABANTIDAE				
<i>Anabas testudineus</i> (Bloch)	10			Freshwater form. Length 30-50 mm
Miscellaneous fish fragments				
Total :	14	70	4.59	Not identifiable.
Phylum Mollusca				
Class Gastropoda				
Order Mesogastropoda				
Family PILDIDAE				
<i>Pila</i> sp.	190			Freshwater form. Mostly soft parts.
Family VIVIPARIDAE				
<i>Viviparus bengalensis</i> (Lamarck)	6			Freshwater form. Entire animal with shell, and some soft parts with broken shells.
Family MELANIDAE				
<i>Melanoides</i> sp.	8			-do-
Order Basommatophora				
Family LYMNAEIDAE				
<i>Lymnaea</i> sp.	17			-do-
Miscellaneous Mollusca (fragments of shells and soft parts)				
Total :	221	818	53.64	Not identifiable.

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Phylum Arthropoda				
Class Crustacea				
Order Decapoda				
Family PORTUNIDAE				
<i>Scylla serrata</i> (Forsk.)	32			Mostly the fleshy portions, with some parts of exoskeleton.
<i>Portunus</i> sp.	5			Mutilated specimens. Identification doubtful.
Family POTAMONIDAE				
<i>Paratelpusa</i> (<i>Barytelpusa</i>) <i>jacquemonti</i> (Rathbun)	11			Mostly body pulp and a few appendages.
Crustacean fragments				Not identifiable.
Total :	48	387	25.37	
Class Insecta				
Family LOCUSTIDAE				
Grasshopper (fragments)				Not identifiable.
Family TETIGONIIDAE				
Longhorned Grasshopper (fragments)				-do-
Family GRYLLIDAE				
Crickets (fragments)				-do-
<i>Grylloides</i> sp. ?	6+			Partly digested.
Family GRYLLOTALPIDAE				
<i>Grylotalpa</i> sp.	18+			-do- Parts of body, head, legs, etc.
Order Hemiptera				
Family BELOSTOMATIDAE				
<i>Belostoma</i> sp.	9+			Elytra mostly.
Total :	33+	66	4.35	
Phylum Annelida				
Class Chaetopoda				
Order Oligochaeta				
Family MEGASCOLECIDAE				
<i>Pheretima</i> sp. ?				In bits. Partially digested. Not identifiable.
Total :		32	2.09	

(N = Number of examples.

Weight = Total weight (in grammes) of examples of all species under a Class.

Length of fish = Its standard length.)

The food of the Openbilled Stork consists solely of animal matter comprising mainly of Mollusca (53·64%). Crustacea comes next in bulk (25·37%). The proportions of other groups are : Reptilia (snakes) 7·40%, Amphibia (Toads and frogs) 2·55%, Insects (grasshoppers and bugs) 4·35%, Oligochaeta (earthworms) 2·09% and fishes 4·59%. The fishes taken are mostly air-breathing freshwater mudfishes which venture out of water. From the contents of stomachs it is seen that the bird is mostly dependent on freshwater forms, as well as on a few land forms.

The food of the Openbilled Stork appreciably differs in wet and dry seasons. During the monsoon when the paddy-fields are inundated, it searches out *Pila* which during this season is dispersed over a great area and is found in abundance. It is then its principal food. It is interesting to note that generally it takes out the fleshy part of larger gastropods but the smaller ones are crushed and taken with the shells. The larger crabs are also appropriated in the same manner. During dry months it congregates largely on the edges of ponds and *gheries* (brackish water fish ponds) where it feeds largely on crabs, fishes, amphibia, snakes, insects, and earthworms.

Out of the 72 birds obtained from the Sundarban area, 46 were collected during the wet season (May-October) and 26 during the dry season (November-April). Analysis of their stomach contents reveals the following seasonal differences in its food-habits :

Animal groups	Wet season (food percentage)	Dry season (food percentage)
Reptilia	6	8·80
Amphibia	—	5·10
Pisces	—	9·00
Mollusca	85	22·28
Crustacea	8	42·14
Insecta	—	8·00
Oligochaeta	—	4·10

Since the Openbilled Stork feeds principally on molluscs (Gastropods) during the wet season, it is not harmful to human economics. The destruction of the snails helps the agriculturists to save their nursery crops from being nibbled and destroyed by snails. Furthermore, the spread of certain helminth parasites is also checked by the destruction of snails which are their intermediate hosts. During the dry season, however, more than half of its food is composed of fishes and crustaceans of commercial value. Its role, during this season therefore, appears to be partially adverse.

Nettapus coromandelianus coromandelianus (Gmelin), Cotton Teal

The Cotton Teal, *Nettapus coromandelianus coromandelianus* (Gmelin) is the smallest of the Indian ducks. It is a resident species in the fresh-water or slightly brackish water pools of the Sundarban reclaimed area. It prefers more or less open waters having reedy borders, and plenty of aquatic vegetation and animal life. It is gregarious, and flocks of 10 to 40 are not uncommon.

Not much information is available about the food-habits of this bird. Hume & Marshall (1880, p. 104) stated: 'Their food consists of rice grain, specially the seed of wild rice known as "Pasaie" in Upper India and of the shoots of various kinds of aquatic plants, worms, water insects, and their larvae. Once or twice I have found what I believed to be the remains of minute fishes and fresh-water crustaceans in their stomachs, but of this I could not be quite certain.' Baker (1929, p. 394) reports that the Cotton Teal feeds on shoots of land and water plants, wild rice and grain and also on insects, worms, snails and small crustacea and Mollusca, though these latter form quite a small percentage of the diet. Ali (1955, p. 108) stated that the food consists chiefly of vegetable matter, also insects, crustaceans, etc.

The detailed analysis of the stomach-contents of 43 adult specimens that the author collected in the Sundarban is given in Table 15.

TABLE 15
ANALYSIS OF THE STOMACH-CONTENTS OF THE COTTON TEAL

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Phylum Chordata				
Series Pisces				
Class Teleostomi				
Order Cypriniformes				
Family CYPRINIDAE				
<i>Puntius</i> sp.	18			Length 3-5 mm. Invariably present in stomachs.
<i>Chela</i> sp.	32			Length 5-10 mm.
<i>Labeo</i> sp.?	3			Partially digested.
Family BAGRIDAE				
<i>Mystus vittatus</i> (Bloch)	17			Length 10-15 mm. Some partly digested.
Order Cyprinodontiformes				
Family CYPRINODONTIDAE				
<i>Oryzias melastigmus</i> (McClelland)	6			Length 5-15 mm. Freshwater form. Not identifiable.
Fish remains				
Total :	76	50	2.50	

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Phylum Mollusca				
Class <i>Gastropoda</i>				
Order <i>Mesogastropoda</i>				
Family <i>VIVIPARIDAE</i>				
<i>Viviparus bengalensis</i> (Lamarck)	10			Mostly with complete shells.
Family <i>MELANIIDAE</i>				
<i>Melanoides</i> sp.	22			-do-
Order <i>Basommatophora</i>				
Family <i>LYMNAEIDAE</i>				
<i>Lymnaea</i> sp.	40			Some complete animals and a few crushed shells.
Family <i>PLANORBIDAE</i>				
<i>Indoplanorbis</i> sp.	25			Not identifiable.
Shell fragments				
Total :	97	370	18.50	
Phylum Arthropoda				
Class <i>Crustacea</i>				
Order <i>Decapoda</i>				
Family <i>PALAEMONIDAE</i>				
<i>Macrobrachium lamarrei</i> (Milne-Edward)	16			Partly broken.
Family <i>ALPHIDAE</i>				
<i>Leander styliferus</i> (Milne-Edward)	30			Invariably present in stomachs.
Family <i>ATYIDAE</i>				
<i>Caridina gracilipes</i> de Man	9			
Family <i>POTAMONIDAE</i>				
<i>Paratalphusa</i> sp. ?	7			Parts of body and appendages.
Crustacean fragments				Not identifiable.
Total :	62	370	18.50	
Class <i>Insecta</i>				
Order <i>Odonata</i>				
Suborder <i>Anisoptera</i>				
Family <i>AESCHNIDAE</i>				
<i>Aeschna</i> sp. ?	31+			Partly digested. Identification doubtful.
Suborder <i>Zygoptera</i>				
Family <i>COENAGRUIDAE</i>				
<i>Ceriatrion</i> sp.	20			
<i>Ischnura</i> sp. ?	10			Partly digested and broken.
Order <i>Hemiptera</i>				
Family <i>NEPIDAE</i>				
<i>Laccotrephes</i> sp.	35			
Family <i>GYRINIDAE</i>				
<i>Dineutus indicus</i> Aube	13			
Family <i>HYDROPHILIDAE</i>				
<i>Hydrophilus</i> sp.	20			
Insect fragments				Not identifiable.
Total :	129+	150	7.50	

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Vegetable matter :				
Family CONVULVACEAE				
<i>Ipomoea</i> sp.				Roots and tender shoots.
Family CERATOPHYLLACEAE				
<i>Ceratophyllum</i> sp.				Part of plant.
Family HYDROCHARIFACEAE				
<i>Hydrilla verticillata</i>				
Family NAIADACEAE				
<i>Ruppia rostellata</i>				
Miscellaneous vegetable matter				Not identifiable.
Total :		1360	68.00	

The food of the Cotton Teal is of mixed type, composed mainly of vegetable matter (68%) with a small percentage of animal matter (32%). The vegetable matter consists of submerged and floating weeds. The major portion of animal matter consists of Mollusca (18.50%). Insects form a small proportion (7.50%) of its diet, the fare consisting mostly of naiads of dragon- and damselflies, aquatic beetles and bugs. The other animals are small freshwater shrimps (18.50%) and freshwater fish fry (standard length 3-15 mm) both of commercial value (Fig. 5).

Although the Cotton Teal consumes fishes and crustaceans of fisheries importance the percentage is so small that it cannot be considered harmful.

***Gallinula chloropus indica* Blyth, The Indian Moorhen**

The Indian Moorhen, *Gallinula chloropus indica* Blyth, is a resident bird of the marshes. It is commonly met with in the freshwater marshes of the reclaimed area, preferring undisturbed water-reservoirs which have plenty of submerged weeds, floating vegetation, reeds and rushes growing in them and shaded by trees on their edges.

About the food-habits of the Indian Moorhen, Jerdon (1864, p. 719) records that its food is chiefly vegetable but it also takes aquatic insects, larvae and even small fish. Blanford (1896, p. 176) states that it feeds on various kinds of vegetable food and on insects. Baker (1929, p. 29) finds that its food consists of water-weeds and berries, grass-insects, snails, worms, frogs and even small fish. Ali (1955) states that its food is insects, worms, molluscs, grain and shoots of paddy and marsh plants.

Regarding another subspecies of the species, the Florida Gallinule, *Gallinula chloropus cachinnans* Bangs, Barrows (1912) states that the food consists largely of insects, chiefly aquatic. Wetmore (1916, p. 326)

found that in Porto Rico, 96.75 per cent of its food was vegetable, grass and rootlets forming 90.75 per cent and the other 6 per cent consisting of seeds of grass and various weeds, much of which must have been picked up on dry land. The remaining 3.25 per cent was made up of insects and a few small molluscs. Bent (1926, p. 352) mentions that its food consists of seeds, roots, and soft parts of succulent water-plants, snails and other small molluscs, grasshoppers and various other insects and worms.

On the European subspecies, *Gallinula chloropus chloropus* (Linnaeus), Collinge (1927, p. 278) who examined ten stomachs found that in Great Britain of the total food-contents 25 per cent consists of animal matter, viz., 1 per cent fish remains, 1.5 per cent tadpoles, 6.5 per cent injurious insects, 1 per cent beneficial insects, 5.5 per cent neutral insects, 4 per cent slugs and snails and 5.5 per cent earthworms; vegetable food forms 75 per cent of the total diet and consists of 55 per cent seeds and fruits of weeds, etc., 15 per cent grass and 5 per cent leaves, moss and vegetable fragment. Voous (1960, p. 86) states that its food consists of mixed animal and vegetable matters and is extremely variable, comprising a great number of marshwater insects (mosquito and their larvae), and all sorts of small water animals, seeds and fruits.

The detailed analysis of the stomach contents of 12 adult specimens of the Indian Moorhen that the author collected in the Sundarban is given in Table 16.

TABLE 16
ANALYSIS OF THE STOMACH-CONTENTS OF THE INDIAN MOORHEN

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Phylum Mollusca				
Class GASTROPODA				
Order Mesogastropoda				
Family VIVIPARIDAE				
<i>Viviparus bengalensis</i> (Lamarck)	13			Some complete and a few crushed shells.
Family LITTORINIDAE				
<i>Littorina melanostoma</i> Gray	9			
Family HYDROBIIDAE				
<i>Digoinostoma pulchella</i> (Benson)	7			
Family MELANIIDAE				
<i>Melanoides tuberculatus</i> (Müller)	25			Invariably present in stomachs.
Order Basommatophora				
Family LYMNAEIDAE				
<i>Lymnaea</i> sp.	18			Partly broken. Invariably present in stomachs.
Shells in fragments				Not identifiable.
Total:	72	102	6.18	

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Phylum Arthropoda				
Class Insecta				
Order Orthoptera				
Family LOCUSTIDAE				
<i>Hieroglyphus</i> sp. ?	2			Partially digested. Identification doubtful.
<i>Chrotogonus</i> sp.	5			Pest of paddy crop and nurseries.
<i>Acrotylus</i> sp.	2			-do-
Family TETTIGIDAE				
<i>Acrydium</i> sp.	2			-do-
Family TETTIGONIDAE				
<i>Phasgonura</i> sp. ?	1			Partly broken and partly digested. Identification doubtful.
Miscellaneous grasshoppers (fragments)				
Order Odonata				
Suborder Anisoptera				
Family AESCHNIDAE				
<i>Aeschna</i> sp. ? (Naiads)	6			Partially digested.
<i>Anax</i> sp. (Naiads)	1			-do-
Suborder Zygoptera				
Family LIBELLULIDAE				
<i>Pantala</i> sp. (Naiads)	2			
Family COENAGRIIDAE				
<i>Ischnaura</i> sp. (Naiads)	1			Partly digested.
<i>Coenagrion</i> sp. (Naiads)	3			
Miscellaneous naiads of Odonata (fragments)				
Not identifiable.				
Order Coleoptera				
Family DYTISCIDAE				
<i>Eretes stictus</i> Linnaeus	3			
<i>Laccophilus</i> sp.	1			
Family GYRINIDAE				
<i>Dineutes</i> sp. ?	2			Partly digested. Identification doubtful.
Order Diptera				
Family CULICIDAE				
Larvae and Pupae (two species)	100+			Invariably present in stomachs. Partly digested. Not identifiable.
Family CHIRONOMIDAE				
Larvae and pupae (one species)	20+			-do-
Insect (fragments)				-do-
Total :	151	48	2.09	
Phylum Annelida				
Class Chaetopoda				
Order Oligochaeta				
Family NAIDIDAE				
<i>Limnodrilus</i> sp.	100+			Tangled mass.
Total :	100+	15	0.90	

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Vegetable matter				
Family CONVULVACEAE				
<i>Ipomoea</i> sp.				
Family LENTIBULARIACEAE				
<i>Utricularia</i> sp.				Floating weed.
Family CERATOPHYLLACEAE				
<i>Ceratophyllum</i> sp.				Submerged weed.
Family HYDROCHARIFACEAE				
<i>Hydrilla verticillata</i>				Aquatic weed.
<i>Vallisneria spiralis</i>				-do-
Family ARACEAE				
<i>Pistia stratiotes</i>				Floating weed.
Family NAIADACEAE				
<i>Ruppia</i> sp.				Submerged weed.
<i>Najas minor</i>				-do-
Miscellaneous vegetable (fragments)				Not identifiable.
Total :		1485	90.00	

Of the total food consumed by the Moorhen, 90% consists of vegetable matter and 10% animal matter. The submerged or floating aquatic weeds form the chief vegetable food. The animal food consists of 2.09% insect, 6.18% freshwater molluscs and 0.90% freshwater Oligochaeta. The insect food is composed of aquatic forms, such as dragon- and damselfly naiads, aquatic beetles, larvae and pupae of mosquitoes and chironomids, and some semi-aquatic and terrestrial grasshoppers. No bugs have been found. Of the 151 examples of insects comprising 15 species, 120 examples representing three species were found to be injurious to public health, such as the mosquitoes and chironomid, and 12 examples representing five species of grasshoppers which are pests of crop and cultivated vegetables.

The Indian Moorhen, therefore, appears to be beneficial since it devours a large number of pests of crop and some disease-carrying insects.

Fulica atra atra Linnaeus, The Coot

The Coot, *Fulica atra atra* Linnaeus, is a bird of the open waters. In the Sundarban, it is usually seen in freshwater stretches which have plenty of submerged aquatic herbage skirted by reeds, sedges and bulrushes. It is generally seen in small flocks of 4 to 12 birds, and occasionally singly or in pairs. In winter, the local populations of the Sundarban are augmented by migrants from adjacent areas for food.

Regarding the Coot in India, Jerdon (1864, p. 716) states that it feeds chiefly on vegetable matter, seed and shoots of aquatic plants. Blanford (1898, p. 181) observes that the food consists of water plants, insects

and Mollusca. Whistler (1928, p. 339) stated : ' Its food consists largely of vegetable matter which is taken both on the surface and by diving, but it also eats small fish, insects and mollusca, and is not above devouring the eggs and chicks of other aquatic birds.' According to Baker (1929, p. 35) it often resorts, in the mornings and evenings, to the fields to feed both on young crops and on insects, snails, worms, etc. It is also known to steal other birds' eggs and have been accused of eating their chicks. Ali (1955, p. 85) records that its food is grass and paddy shoots, aquatic weeds, and insects, molluscs, etc.

In Europe, Townsend (cited by Bent, 1926, pp. 356-357) found that its food consists of aquatic insects, molluscs, slugs, worms and small fishes, seeds, buds and tender shoots of aquatic plants. It also eats meadow grass and berries. Voous (1960, p. 87) states that its food is mixed but mainly vegetable, quantities of the submerged parts of plants obtained by diving, also seeds, fruits, buds and petals of flowers of marsh and water plants, in winter grass and in summer minute water animals.

The detailed analysis of the stomach contents of 36 adult specimens that I collected in the Sundarbans is given in Table 17.

TABLE 17
ANALYSIS OF THE STOMACH-CONTENTS OF THE COOT

Items of diet	No.	Wt.(g)	%(Wt.)	Remarks
Phylum Chordata				
Class Amphibia				
Order Anura				
Family RANIDAE				
<i>Rana</i> sp. (tadpoles)	27			
<i>Rana limnocharis</i> Boie ?	3			Partly digested.
Total :	30	50	2.81	
Series Pisces				
Class Teleostomi				
Order Cypriniformes				
Family CYPRINIDAE				
<i>Chela</i> sp.	32			Length 10-15 mm Freshwater form. Invariably present in stomachs.
<i>Labeo</i> sp.	6			Length 15-25 mm Freshwater form.
<i>Puntius sarana</i> (Hamilton) ?	14			Freshwater form. Partly digested. Identification doubtful.

Items of diet	No.	Wt.(g)	% (Wt.)	Remarks
Family BAGRIDAE <i>Mystus vittatus</i> (Bloch)	7			Length 20-25 mm Freshwater form.
Order Anguilliformes Family ANGUILLIDAE <i>Anguilla bengalensis</i> (Gray)	3			Length 30-50 mm Fresh and brackish water form.
Order Cyprinodontiformes Family CYPRINODONTIDAE <i>Aplocheilus panchax</i> (Hamilton)	2			Length 25-40 mm Freshwater form.
Total :	64	130	6.77	
Phylum Mollusca				
Class Gastropoda				
Order Mesogastropoda				
Family VIVIPARIDAE <i>Viviparus</i> sp.	16			Some complete and some broken shells.
Family MELANIIDAE <i>Melanoides</i> sp.	19			Some complete shells.
<i>Pila</i> sp.	3			
Order Basommatophora Family LYMNAEIDAE <i>Lymnaea</i> sp.	35			Partly broken shells.
Family PLANORBIDAE <i>Indoplanorbis</i> sp. Broken shells	22			Not identifiable.
Total :	95	250	13.02	
Phylum Arthropoda				
Class Insecta				
Order Odonata				
Suborder Anisoptera				
Family AESCHNIDAE <i>Anax</i> sp. ? (naiads)	10			Aquatic.
<i>Aeschna</i> sp. ? (naiads)	7			Aquatic.
Order Hemiptera Family BELOSTOMATIDAE <i>Belostoma</i> sp.	3			Aquatic form.
Family NEPIDAE <i>Laccotrephes</i> sp.	4			Aquatic form.
Order Coleoptera Family DYTISCIDAE <i>Eretes stictus</i> Linnaeus	17			Aquatic form.
<i>Laccophilus</i> sp.	26			Aquatic form.

Items of diet	No.	Wt.(g)	% (Wt.)	Remarks
Family GRINIDAE <i>Dineutes indicus</i> Aube	2			Aquatic form.
Order Diptera Family CULICIDAE Larvae and pupae	100+			
Total :	169	150	7.00	
Phylum Annelida Class Chaetopoda Order Oligochaeta Family NAIDIDAE <i>Limnodrilus</i> sp.	100+			Tangled mass.
Family MEGASCOLICIDAE <i>Pheretima</i> sp.	6			
Total :	106+	120	6.25	
Vegetable matter Family CONVULVACEAE <i>Ipomoea</i> sp.				Roots and tender shoots.
Family CERATOPHYLLACEAE <i>Ceratophyllum</i> sp.				
Family HYDROCHARIFACEAE <i>Hydrilla verticillata</i> <i>Vallisneria spiralis</i>				
Family GRAMINAEAE <i>Oryza sativa</i> <i>Panicum</i> sp.				
Total :		1220	63.53	

The food of the Coot consists of both vegetable matter (63.53%) and animal matter (36.47%). The vegetable matter consists of submerged and floating weeds, tender roots and shoots, grass, paddy shoots and buds, immature grains, etc. The animal matter consists of 6.25% of freshwater and land Oligochaeta (earthworm), 13.02% of freshwater gastropods, 7% of aquatic insects consisting mostly of naiads of dragon- and damselflies, mosquito larvae and pupae, aquatic Coleoptera etc.; fishes consisting of small freshwater species (standard length 10-50 mm.) of commercial value, 6.77%.

On the whole the bird does not appear to be a harmful one. The total amount of paddy shoots, grain and fishes taken is negligible, and this is largely compensated by the good it does by consuming large numbers of mosquito larvae and pupae.

(to be continued)